

Claims

1. A method for contracting AC power transfer on an AC power network with a flow gate collection containing at least one flow gate comprising:

contracting an AC power transfer on said AC power network comprising;

5 contracting an associated AC power transfer on each of said flow gates of said flow gate collection.

2. The method of Claim 1,

wherein contracting for AC power transfer on said AC power network comprises:

10 contracting for AC power transfer on said AC power network to take place over a first time interval; and

wherein contracting said associated AC power transfer on each of said flow gates of said flow gate collection comprises;

15 contracting said associated AC power transfer on each of said flow gates of said flow gate collection to take place over at least said first time interval.

3. The method of Claim 2, further comprising:

contracting an AC power transfer collection of at least two AC power transfers on an AC power network further comprises;

20 contracting a sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of said flow gates of said flow gate collection.

4. The method of Claim 3,

wherein each flow gate of said flow gate collection has an associated maximum safe carrying capacity; and

25 wherein contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of said flow gates of said flow gate collection comprises;

said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection satisfying said associated maximum safe carrying capacity on each of said flow gates of said flow gate collection.

5 5. The method of Claim 3,

wherein each of said AC power transfers of said AC power transfer collection is to take place over a first time interval; and

wherein contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of  
10 said flow gates of said flow gate collection comprises;

contracting each of said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection to take place at least over said first time interval.

6. The method of Claim 3,

15 wherein each of said AC power transfers of said AC power transfer collection has an associated amount of energy from an associated first node of said AC power network to a second node of said AC power network; and

further contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of said  
20 flow gates of said flow gate collection comprises;

contracting an amount of energy of said associated AC power transfer on each of said flow gates of said flow gate collection as essentially an associated linear, skew-symmetric function of said associated amount of energy from said associated first node to said associated second node.

25 7. The method of Claim 1,

wherein each of said flow gates of said flow gate collection is a significant flow gate of said AC power network.

8. The method of Claim 1,

wherein each significant flow gate of said AC power network is a flow gate in said flow gate collection.

9. The method of Claim 1,

wherein contracting for said AC power transfer on said AC power network comprises;

contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection; and

enabling said first party to further contract to sell said first party owned AC power transfer trading rights.

10. The method of Claim 9,

wherein each of said flow gates of said flow gate collection has an associated maximum safe carrying capacity; and

further comprising scheduling said AC power transfer for said agreed contract comprising:

determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate collection; and

approving said AC power transfer whenever said associated AC power transfer of said flow gate satisfies said maximum safe carrying capacity for each said flow gates of said flow gate collection.

11. The method of Claim 10,

wherein enabling said first party to further contract to sell said first party owned AC power transfer trading rights comprises;

enabling said first party to further contract to sell said first party owned AC power transfer trading rights before scheduling said AC power transfer for said agreed contract.

12. The method of Claim 10,

wherein said agreed contract by said first party to own said AC power transfer trading rights with said associated AC power transfers on a first of said flow gates of said flow gate collection is to take place over a first time interval;  
5 and

wherein scheduling said AC power transfer for said agreed contract further comprises:

scheduling said AC power transfer for said agreed contract occurs before said first time interval.

10 13. The method of Claim 12,

wherein determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate collection further comprises;

15 determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate collection over said first time interval; and

20 wherein approving said AC power transfer whenever said associated AC power transfer of said flow gate satisfies said maximum safe carrying capacity for each said flow gate of said flow gate collection further comprises;

25 approving said AC power transfer over said first time interval whenever said associated AC power transfer of said flow gate satisfies said maximum safe carrying capacity for each said flow gates of said flow gate collection over said first time interval.

14. The method of Claim 13, further comprising:

contracting for an AC power transfer collection of at least one AC power transfer to create an agreed contract by a first party to own AC power transfer

trading rights with associated AC power transfers on each of said flow gates of said flow gate collection further comprises;

contracting for a sum of associated AC power transfers for all AC power transfers of said AC power transfer collection to create a contract for an associated AC power transfer for said collection of AC power transfers for each of said flow gates of said flow gate collection.

15. The method of Claim 14, further comprising:

wherein each of said AC power transfers of said AC power transfer collection has an associated amount of energy from an associated first node of said AC power network to said second node of said AC power network;

wherein contracting for a sum of associated AC power transfers for all AC power transfers of said AC power transfer collection to create a contract for an associated AC power transfer for said collection of AC power transfers for each of said flow gates of said flow gate collection comprises;

calculating said associated AC power transfer on said flow gate of said AC power transfer as an amount of energy which is an essentially linear, skew-symmetric associated function of said amount of energy of said AC power transfer from said associated first node of said AC power transfer to said associated second node of said AC power transfer of each of said flow gates of said flow gate collection.

16. The method of Claim 9, further comprising:

wherein enabling said first party to further contract to sell said first party owned AC power transfer trading rights further comprises;

enabling said first party to further contract to sell said first party owned AC power transfer trading rights for said associated AC power transfer for a first of said flow gates of said flow gate collection.

17. The method of Claim 16, further comprising:

wherein enabling said first party to further contract to sell said first party owned AC power transfer trading rights further comprises;

enabling said first party to further contract to sell said first party owned AC power transfer trading rights for said associated AC power transfer for each of said flow gates of said flow gate collection.

18. The method of Claim 9,  
5 wherein said first party is a human being.

19. The method of Claim 18,  
wherein said first party is a corporate entity.

20. The method of Claim 19,  
wherein said first party is represented by an agent authorized by said first  
10 party to act on behalf of said first party with respect to contracting AC power transfer.

21. The method of Claim 20,  
wherein said agent is a software agent executing on a computer.

22. The method of Claim 1,  
15 wherein said computing system is comprised of  
a client computer collection containing at least one client computer  
operated by a client;

a server system containing at least one server computer; and  
a network coupling said client computer of said client computer collection  
20 and coupling at least a first of said server computers of said server system; and  
wherein contracting said AC power transfer on said AC power network  
further comprises

identifying a first of said clients operating a first of said client computers as  
said first party.

23. The method of Claim 22, further comprising:

a first client user operating said first client computer as said first party residing on said computer readable memory coupled to said first client computer comprising;

receiving a stimulus from said first user to create a received stimulus stream;

communicating via said network with said first server computer to create a received server stream and to create a server delivery stream; and

displaying an interactive status based upon said received stimulus stream and said received server stream; and

wherein contracting said AC power transfer on said AC power network further comprises

communicating via said network with said first client computer to create a received server delivery stream.

24. The method of Claim 23,

wherein contracting AC power transfer on said AC power network further comprises;

operating a virtual trading floor containing a market for trading AC power transfer for each of said flow gates of said flow gate collection further comprising

transforming said received server delivery stream into an order collection containing at least one bid order and at least one ask order; and

contracting AC power transfer on said AC power network to create an agreed contract based upon a first of said bid orders of said order collection and based upon a first of said ask orders of said order collection.

25. A program operating system executing on a computing system comprised of at least one computer, each of said computers in said computing system coupled to an associated computer readable memory, supporting with program code segments contracting AC power transfer on an AC power network with a flow gate collection containing at least one flow gate, comprising:

a program code segment supporting contracting an AC power transfer on said AC power network comprising;

a program code segment supporting contracting an associated AC power transfer on each of said flow gates of said flow gate collection.

5 26. The program operating system of Claim 25,

wherein said program code segment supporting contracting an AC power transfer on said AC power network comprises;

a program code segment supporting contracting an AC power transfer on said AC power network to take place over a first time interval; and

10 wherein said program code segment supporting contracting said associated AC power transfer on each of said flow gates of said flow gate collection comprises;

15 a program code segment supporting contracting said associated AC power transfer on each of said flow gates of said flow gate collection to take place over at least said first time interval.

27. The program operating system of Claim 26, further comprising:

a program code segment supporting contracting an AC power transfer collection of at least two AC power transfers on an AC power network further comprises

20 a program code segment supporting contracting a sum of said associated AC power transfers for each of said AC power transfers of said AC power transfer collection on each of said flow gates of said flow gate collection.

28. The program operating system of Claim 27,

25 wherein each flow gate of said flow gate collection has an associated maximum safe carrying capacity; and

wherein said program code segment supporting contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of said flow gates of said flow gate collection comprises;



a program code segment supporting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection satisfying said associated maximum safe carrying capacity on each of said flow gates of said flow gate collection.

- 5 29. The program operating system of Claim 27,  
wherein each of said AC power transfers of said AC power transfer collection is to take place over a first time interval; and

wherein said program code segment supporting contracting said sum of said associated AC power transfer for each of said AC power transfers of said  
10 AC power transfer collection on each of said flow gates of said flow gate collection comprises;

a program code segment supporting contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection to take place at least over at least said first time interval  
15 on each of said flow gates of said flow gate collection.

30. The program operating system of Claim 27,  
wherein each of said AC power transfers of said AC power transfer collection has an associated amount of energy from an associated first node of said AC power network to a second node of said AC power network; and

20 said program code segment supporting contracting said sum of said associated AC power transfer for each of said AC power transfers of said AC power transfer collection on each of said flow gates of said flow gate collection comprises

a program code segment essentially calculating an amount of energy of  
25 said associated AC power transfer on each of said flow gates of said flow gate collection as essentially an associated linear, skew-symmetric function of said associated amount of energy from said associated first node to said associated second node.

31. The program operating system of Claim 25,

wherein each of said flow gates of said flow gate collection is a significant flow gate of said AC power network.

32. The program operating system of Claim 25,  
wherein each significant flow gate of said AC power network is a flow gate  
5 in said flow gate collection.

33. The program operating system of Claim 25,  
wherein said program code segment supporting contracting for said AC  
power transfer on said AC power network further comprises;

a program code segment supporting contracting for said AC power  
10 transfer on said AC power network to create an agreed contract by a first party to  
own AC power transfer trading rights with associated AC power transfers on  
each of said flow gates of said flow gate collection; and

a program code segment supporting enabling said first party to further  
contract to sell said first party owned AC power transfer trading rights.

15 34. The program operating system of Claim 33,  
wherein each of said flow gates of said flow gate collection has an  
associated maximum safe carrying capacity; and

further comprising a program code segment supporting scheduling said  
AC power transfer for said agreed contract comprising;

20 a program code segment supporting determining whether said associated  
AC power transfer of said flow gate of said flow gate collection satisfies said  
associated maximum safe carrying capacity of said flow gate for each of said  
flow gates of said flow gate collection; and

a program code segment supporting approving said AC power transfer  
25 whenever said associated AC power transfer of said flow gate satisfies said  
maximum safe carrying capacity for each said flow gates of said flow gate  
collection.

35. The program operating system of Claim 34,

wherein performing said program code segment supporting enabling said first party to further contract to sell said first party owned AC power transfer trading rights occurs before performing said program code segment supporting scheduling said AC power transfer for said agreed contract.

5 36. The program operating system of Claim 34,

wherein said agreed contract by said first party to own said AC power transfer trading rights is to take place over a first time interval; and

wherein performing said program code segment supporting scheduling said AC power transfer for said agreed contract occurs before said first time  
10 interval.

37. The program operating system of Claim 36,

wherein determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate  
15 collection further comprises;

determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate collection over said first time interval; and

20 wherein approving said AC power transfer whenever said associated AC power transfer of said flow gate satisfies said maximum safe carrying capacity for each of said flow gates of said flow gate collection further comprises;

approving said AC power transfer over said first time interval whenever said associated AC power transfer of said flow gate satisfies said maximum safe  
25 carrying capacity for each said flow gates of said flow gate collection over said first time interval.

38. The program operating system of Claim 37, further comprising:

a program code segment supporting contracting for an AC power transfer collection of at least one AC power transfer to create an agreed contract by a

first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection further comprises;

5 a program code segment supporting contracting for a sum of associated AC power transfers for all AC power transfers of said AC power transfer collection to create a contract for an associated AC power transfer for said collection of AC power transfers for each of said flow gates of said flow gate collection.

39. The program operating system of Claim 38,

10 wherein each of said AC power transfers of said AC power transfer collection has an associated amount of energy from an associated first node of said AC power network to said second node of said AC power network;

15 wherein a program code segment supporting contracting for a sum of associated AC power transfers for all AC power transfers of said AC power transfer collection to create a contract for an associated AC power transfer for said collection of AC power transfers for each of said flow gates of said flow gate collection comprises;

20 a program code segment calculating each of said associated AC power transfers on said flow gate of said AC power transfer has an amount of energy as an essentially linear, skew-symmetric function of said amount of energy from said associated first node to said associated second node of said AC power transfer of each of said flow gates of said flow gate collection.

40. The program operating system of Claim 33,

25 wherein said program code segment supporting enabling said first party to further contract to sell said first party owned AC power transfer trading rights further comprises;

a program code segment supporting enabling said first party to further contract to sell said first party owned AC power transfer trading rights for said

associated AC power transfer for a first of said flow gates of said flow gate collection.

41. The program operating system of Claim 40,

wherein said program code segment supporting enabling said first party to  
5 further contract to sell said first party owned AC power transfer trading rights further comprises;

a program code segment supporting enabling said first party to further  
contract to sell said first party owned AC power transfer trading rights for said  
associated AC power transfer for each of said flow gates of said flow gate  
10 collection.

42. The program operating system of Claim 33,  
wherein said first party is a human being.

43. The program operating system of Claim 42,  
wherein said first party is a corporate entity.

15 44. The program operating system of Claim 43,  
wherein said first party is represented by an agent authorized by said first  
party to act on behalf of said first party with respect to contracting said AC power  
transfer.

45. The program operating system of Claim 25,  
20 wherein said computing system is further comprised of  
a client computer collection containing at least one client computer with  
coupled computer readable memory operated by a client;

a server system containing at least one server computer with coupled  
computer readable memory; and

25 a network coupling each of said client computers of said client computer  
collection and coupling at least a first of said server computers of said server  
system; and

wherein said program code segment supporting contracting said AC power transfer on said AC power network further comprises;

5 a program code segment residing in said computer readable memory coupled to at least one of said server computers of said server system supporting identifying a first of said clients operating a first of said client computers as said first party.

46. The program operating system of Claim 45, further comprising

10 a program code segment supporting said first client user operating said first client computer as said first party residing on said computer readable memory coupled to said first client computer comprising:

a program code segment supporting receiving stimulus from said first user to create a received stimulus stream;

15 a program code segment supporting communicating via said network with said first server computer to create a received server stream and to create a server delivery stream; and

a program code segment supporting displaying a status based upon said received stimulus stream and said received server stream; and

20 wherein said program code segment supporting contracting said AC power transfer on said AC power network further comprises;

a program code segment supporting communicating via said network with said first client computer to create a received server delivery stream.

47. The program operating system of Claim 46,

wherein said program code segment supporting contracting AC power transfer on said AC power network further comprises;

25 a program code segment supporting operating a virtual trading floor containing a market interval for trading AC power transfer for each of said flow gates of said flow gate collection further comprising;

a program code segment supporting transforming said received server delivery stream into an order collection containing at least one bid order and at least one ask order; and

5 a program code segment supporting contracting AC power transfer on said AC power network to create an agreed contract based upon a first of said bid orders of said order collection and based upon a first of said ask orders of said order collection.

48. The program operating system of Claim 47,

10 wherein each of said validated orders of said validated order collection belongs to a collection comprising a bid type and an ask type;

wherein program code segment supporting contracting said AC power transfer on said AC power network to create an agreed contract further comprises

15 a program code segment supporting contracting said AC power transfer on said AC power network to create an agreed contract based upon a first bid type order of said validated orders of said validated order collection and a first ask type order of said validated orders of said validated order collection.

49. The program operating system of Claim 48,

20 wherein supporting contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection further comprises;

25 a program code segment supporting contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection based upon a first bid type order of said validated orders of said validated order collection and a first ask type order of said validated orders of said validated order collection.

50. The program operating system of Claim 48,  
wherein at least one market interval is associated with each flow gate of  
said flow gate collection.

51. The program operating system of Claim 50,

5 wherein said server system is further comprised of a reliable server  
collection of server computers performing a reliable distributed system with a  
process group collection of at least one process group;

wherein each of said server computers is accessibly coupled with a  
computer memory, of said reliable server system; and

10 wherein said program operating system includes program code segments  
implementing at least one of the process groups of said collection of process  
groups.

52. A computing system supporting program operating system of program  
code segments with program code segments contracting an AC power transfer  
15 on an AC power network with a flow gate collection containing at least one flow  
gate, comprised of:

at least one computer, each of said computers in said computing system  
coupled to an associated computer readable memory;

20 wherein each of said program code segments resides in said computer  
readable memory coupled to at least one of said computers in said computing  
system;

wherein said program operating system contains a program code  
segment supporting contracting an AC power transfer on said AC power network  
further comprising;

25 a program code segment supporting contracting an associated AC power  
transfer on each of said flow gates of said flow gate collection.

53. A computing system of Claim 52,

wherein said program code segment supporting contracting for said AC  
power transfer on said AC power network further comprises;



a program code segment supporting contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection; and

5 a program code segment supporting enabling said first party to further contract to sell said first party owned AC power transfer trading rights.

54. A computing system of Claim 53,

wherein each of said flow gates of said flow gate collection has an associated maximum safe carrying capacity; and

10 said program operating system further containing a program code segment supporting scheduling said AC power transfer for said agreed contract comprising;

a program code segment supporting determining whether said associated AC power transfer of said flow gate of said flow gate collection satisfies said  
15 associated maximum safe carrying capacity of said flow gate for each of said flow gates of said flow gate collection; and

a program code segment supporting approving said AC power transfer whenever said associated AC power transfer of said flow gate satisfies said maximum safe carrying capacity for each said flow gates of said flow gate  
20 collection.

55. A computing system of Claim 54, further comprised of:

a client computer collection containing at least one client computer with coupled computer readable memory operated by a client;

a server system containing at least one server computer with coupled  
25 computer readable memory; and

a network coupling each of said client computers of said client computer collection and coupling at least a first of said server computers of said server system; and

wherein said program code segment supporting contracting said AC power transfer on said AC power network further comprises

a program code segment residing in said computer readable memory coupled to at least one of said server computers of said server system supporting identifying a first of said clients operating a first of said client computers as said first party.

56. A computing system of Claim 55,

wherein said program operating system further comprising;

a program code segment supporting said first client user operating said first client computer as said first party residing on said computer readable memory coupled to said first client computer comprising;

a program code segment supporting receiving stimulus from said first user to create a received stimulus stream;

a program code segment supporting communicating via said network with said first server computer to create a received server stream and to create a server delivery stream; and

a program code segment supporting displaying a status based upon said received stimulus stream and said received server stream; and

wherein said program code segment supporting contracting said AC power transfer on said AC power network further comprises;

a program code segment supporting communicating via said network with said first client computer to create a received server delivery stream.

57. A computing system of Claim 56,

wherein said program code segment supporting contracting AC power transfer on said AC power network further comprises;

a program code segment supporting operating a virtual trading floor containing a market interval for trading AC power transfer for each of said flow gates of said flow gate collection further comprising

a program code segment supporting transforming said received server delivery stream into an order collection containing at least one bid order and at least one ask order; and

5 a program code segment supporting contracting AC power transfer on said AC power network to create an agreed contract based upon a first of said bid orders of said order collection and based upon a first of said ask orders of said order collection.

58. A computing system of Claim 57,

10 wherein each of said validated orders of said validated order collection belongs to a collection comprising a bid type and an ask type;

wherein said program code segment supporting contracting said AC power transfer on said AC power network to create an agreed contract further comprises;

15 a program code segment supporting contracting said AC power transfer on said AC power network to create an agreed contract based upon a first bid type order of said validated orders of said validated order collection and a first ask type order of said validated orders of said validated order collection.

59. A computing system of Claim 58,

20 wherein said program code segment supporting contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection further comprises;

25 a program code segment supporting contracting for said AC power transfer on said AC power network to create an agreed contract by a first party to own AC power transfer trading rights with associated AC power transfers on each of said flow gates of said flow gate collection based upon a first bid type order of said validated orders of said validated order collection and a first ask type order of said validated orders of said validated order collection.

60. A computing system of Claim 59,

wherein at least one market interval is associated with each flow gate of said flow gate collection.

61. A computing system of Claim 60,

wherein said server system is further comprised of a reliable server  
5 collection of server computers performing a reliable distributed system with a  
process group collection of at least one process group;

wherein each of said server computers is accessibly coupled with a  
computer memory, of said reliable server system; and

wherein said program operating system includes program code segments  
10 implementing at least one of the process groups of said collection of process  
groups.